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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SIMKOVIC, VIKTOR

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 05/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/749,171

Applicant(s)

CABUZ ET AL.

Examiner

Viktor Simkovic

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 22 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-13 and 23 is/are allowed.
- 6) ☒ Claim(s) 1-6, 14-18, 20 and 21 is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Newly submitted claim 22 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The device could be formed by a patentably different process, such as etching the openings first and then etching out the recess through the openings.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 22 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-6, 14-18, 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atobe et al. Atobe et al. teach a method for making a thin silicon structure comprising the steps of:

providing a glass substrate (Fig. 5A);

providing a silicon substrate having two planar surfaces (Fig. 4A);

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forming a recess in said glass substrate (Fig. 5C);

bonding said silicon substrate to said glass substrate such that at least part of said silicon wafer bonds the glass wafer and part of it overhangs the recess (Fig. 4I);

selectively removing a portion of said silicon substrate to form an overhanging structure (Fig. 4I).

Please note that layer 112 is just a doped portion of the silicon layer and thus is still the silicon substrate surface. While Atobe et al. teach removing a portion of said silicon substrate before the bonding step, and in claim 1 the removing step is done after the bonding step, in general, the transposition of process steps or the splitting of one step into two, where the processes are substantially identical or equivalent in terms of function, manner, and result, was held to not patentably distinguish processes. *Ex parte Rubin* 128 USPQ 440 (PTO BdPatApp 1959). Applicant has not provided any evidence that removing a portion of the substrate after the two substrates have been bonded together would yield new or unexpected results. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to switch the two steps.

With regard to claim 2, see Fig. 5F, item 236, which is an electrode film formed on the glass substrate. With regard to claim 4, see column 16, line 20, where a gold electrode is taught. With regard to claim 5, see column 16, line 38, where anodic bonding is taught. With regard to claim 6, see column 14, line 27, where RIE is taught.

With regard to claim 14-18, claim 14 only differs from claim 1 in that it does not specify the types of wafers, and claims 15-18 simply specify this, namely specifying glass and silicon wafers.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atobe et al. While Atobe et al. does not specifically mention a Ti-Pt electrode, such electrode are well known in the art and it would have been obvious to one of ordinary skill in the art at the time of the invention to use such an electrode, since this is common in the art.

Official notice is taken.

With regard to claim 20, the limitations of this claim are identical to those of claim 1, with slightly broader language. Thus the comments made above with regard to claim 1 also apply to claim 20. With regard to claim 21, the additional limitation here is "said thin structure being doped at a concentration of between zero and 1×10^{18} atm/cm³." however, Atobe et al. teach a concentration of 1×10^{18} atm/cm³ (column 12, line 62). Overlapping ranges are *prima facie* cases of obviousness. It would have been obvious to one having ordinary skill in the art to have selected the portion of the doping range that corresponds to the claimed range. *In re Malagari*, 184 USPQ 549 (CCPA 1974).

Allowable Subject Matter

Claims 7-13 and 23 are allowed.

Claim 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Prior art of record fails to teach the method of forming a thin structure such that

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a glass wafer with a recess is bonded to a silicon wafer with a metal layer corresponding to the recess, and the silicon layer is etched to form an overhanging structure over the recess, using the metal layer as an etch stop, after which the metal layer is removed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant's attention is especially drawn to U.S. Pat. No. 6,242,276 and Japanese Patent JP410242483A (which also teaches an overhanging portion over a recess which is not doped).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Viktor Simkovic whose telephone number is 703-308-6170. The examiner can normally be reached on Mon - Fri, 9:00 - 6:00, except every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 703-308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Viktor Simkovic
May 21, 2002



John F. Niebling
Supervisory Patent Examiner
Technology Center 2000